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DRAFT Southern California Association of Governments Energy, Commerce and Resources Catalog Greenhouse Gas Reduction Policy Options

This catalog of Residential, Commercial and Industrial regional-level greenhouse gas (GHG) reducing actions and policy options prepared by the Center for Climate Strategies (CCS) is based on actions undertaken or considered in state- and region-wide climate change action plans by multi-stakeholder groups in a wide cross-section of U.S. states and by state, local and private participants.

Sector 1 of 4: Residential, Commercial, and Industrial Energy Use

Table	Sector Covered
1	Residential, Commercial, Industrial (RCI)

Key to Rankings* of Options in the Table that Follows:

Potential GHG Emission Reductions 1/	Potential Cost or Cost Savings [1, 2]
High (H): At least 1.0 million metric tons (MMt) carbon dioxide equivalent (CO_2e) per year by 2025	**High (H)**: $50 per metric ton CO_2e (tCO_2e) or above
Medium (M): From 0.1 to 1.0 $MMtCO_2e$ per year by 2025	**Medium (M):** $5 to 50/$tCO_2e$
Low (L): Less than 0.1 $MMtCO_2e$ per year by 2025, or 1 MMtCO2e by 2050	**Low (L):** Less than $5/$tCO_2e$
Uncertain (U): Not able to estimate at this time	**Uncertain (U):** Not able to estimate at this time
1 Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures. 2 Costs are denoted by a positive number. Cost *savings* (i.e., "negative costs") are denoted by a negative number.	

The GHG reductions or cost/cost savings of some policy options are not quantified (NQ) due to lack of data or for other reasons.

Definition of "Priorities for Analysis*":

- **High:** High priority options will be analyzed first.
- **Medium:** Medium priority options will be analyzed next, time and resources permitting.
- **Low**: Low priority options will be analyzed last, time and resources permitting.

Important Note: The actions are numbered in this catalog solely for convenience in referencing them. Their numbers do NOT reflect a ranking or prioritization of the actions.

*To be completed as part of the on-going process

Table-1 Residential, Commercial, and Industrial (RCI)

This catalog will be developed more fully during the Multi-Sector TWG process. TWG members are encouraged to provide input on policies and programs in place in Southern California to assist in defining baselines. The "Notes" column may be used to record recently enacted policies and programs in California relevant to policy options and management actions in the catalog.

(Note: Some RCI policies overlap with or are repeated in Table 2-Energy Supply.)

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reductions	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in Southern California
RCI-1	**ENERGY EFFICIENCY PROGRAMS, FUNDS, AND GOALS**					
1.1	Utility Demand Side Management (DSM) Programs for electricity					
1.2	Utility Demand Side Management (DSM) Programs for natural gas, propane, and fuel oil					
1.3	Non-utility Demand Side Management (DSM) Programs for Electricity (munis, co-ops, etc.)					
1.4	Energy Efficiency Funds (e.g. Public Benefit Funds) Administered by Local Agency, Utility, or Third Party (e.g. Energy Trust)					Emphasize low-interest lending
1.5	Regional Market Transformation Alliances, Technology Development Programs and Education			Includes research and development		
1.6	Reduced Cost or Free Residential Energy Audits					

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1.7	Reduced-Cost Energy Audits or Technical Assistance for Commercial Businesses					
1.8	Reduced-Cost Energy Audits or Technical Assistance for Industry Sectors					
1.9	Low-cost Loans for Energy Efficiency Improvements			Loan programs' success depends heavily on programs design		
1.10	Saving Energy, Savings Sales Tax			Sales tax holidays often shift sales from one period to another		
1.11	Reduce Energy Use by 10% or More in Government-Owned Buildings					
1.12	Encourage Integrated Lean Manufacturing and Energy Use Reduction through Technical Assistance to Industrial and Commercial Facilities					
1.13	Develop Investment Tax Credits for Energy Efficiency Improvements in Industrial or Commercial Facilities					
1.14	Inverted Block Rates to Fund Energy Efficiency			Pair with efficiency program or smart meters		
1.15	Require Energy Audit on Sale of Property					

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1.16	PACE (Property Assessed Clean Energy - financing) for Energy Efficiency and Renewables					
1.17	On-bill Financing of Energy Efficiency Upgrades					
RCI-2	**BUILDINGS AND FACILITIES**					
2.1	Improved Building Codes for Energy Efficiency			New buildings or substantial retrofits (can include 'Beyond Code' incentives or requirements)		California Green Building Standards (CalGreen) were passed in CA in 2008 and are in effect as of 2010
2.2	Training of Building Code and Other Officials in Energy Code Enforcement			High value; best building codes include training elements		
2.3	Improved Design and Construction, "Government Lead by Example"			Impact depends on amount of government building construction		
2.4	Increased Use of Blended Cement (substituting fly ash or other pozzolans for clinker reduces CO_2 emissions)					
2.5	Support for energy efficient communities planning, "smart growth"					
2.6	Promotion and Incentives for Improved Design and Construction (e.g. LEED[4], green buildings)					
2.7	Feebate Program to Encourage Energy Efficiency in Building Design					

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reductions	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in Southern California
2.8	Incentives and/or Targets for Retrofit of Existing Residential Commercial, Institutional and Industrial Buildings					See proposed Federal HOME STAR Program for additional actions
2.9	Training and Education for Builders and Contractors (e.g. heating, ventilation, air conditioning, sizing, duct sealing)					
2.10	Energy Management Training/Training of Building Operators					
2.11	Energy Efficiency in Government Buildings			Construction and equipment		
2.12	Require New Government Buildings to Meet LEED Gold Certification or Equivalent					CalGreen standards, in many cases, exceed LEED standards
2.13	~~Create Incentives and Targets for Retrofit of Existing Commercial or Industrial Buildings~~	Combined with 2.8				
2.14	Develop a Modified Cap & Trade Program for Commercial Buildings					
2.15	Building Commissioning and Re-commissioning, including Energy Tracking and Benchmarking					
2.16	Explore Advanced Metering Technologies to Monitor Energy Usage and Allow Homeowners and Managers to Adjust Energy Use Remotely			Metering can be expensive; remote power controls may not be critical		

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2.17	Require Solar-Ready Building Infrastructure and Require Solar Hot Water Systems in New Buildings					
2.18	Encourage Photovoltaic Integration into Building Materials and Surfaces					
2.19	Explore Zero-Net Energy Use Building Design					
2.20	Integrate Energy Storage Technology into Building Design					
RCI-3	**APPLIANCE STANDARDS**					
3.1	Expansion of State-level Appliance Efficiency Standards					
3.2	Support for Higher Federal Efficiency Standards					
3.3	Require High-Efficiency Appliances in New Construction and Retrofits					
3.4	Support Regional and Local Ordinances Above-and-Beyond State and Federal Codes					Numerous municipalities within the SCAG region have adopted strong codes
RCI-4	**EDUCATION AND OUTREACH**					
4.1	Consumer Education Programs			Extend to retailers, businesses, students and teachers		
4.2	Energy Efficiency School Curriculum					Now required in CA, in final stages of development
4.3	Truth in Advertising Campaign					

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4.4	In-home Energy Displays					
4.5	Create a High-Tech Research and Development Center that Focuses on Renewable Energy and Energy Efficiency					
4.6	Information and Technical Support for Broad Spectrum of Climate Change Actions					
4.7	Workforce Training for Green Jobs			Manufacturing, installation, operations, maintenance,		See Los Angeles Community College District's Program
4.8	Utilities Provide Information about Energy Use and Suggest Targets for Consumers					
4.9	Supply Training and Support for Customers of New Green Technologies					
4.10	Energy Efficiency Training for Public					
4.11	Scenario Planning and Media Training					Carpe Diem West has developed advanced education options
RCI-5	**PRICING AND PURCHASING**					
5.1	Green Power Purchasing for Consumers					
5.2	Net-metering for Distributed Generation					
5.3	Time of Use Rates			Seasonal use rates		
5.4	Inverted Block Rates to Fund Energy Efficiency			Also improves efficiency. See 1.14		

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5.5	Bulk Purchasing Programs for Energy Efficiency or other Equipment (Public or Private sector)					
5.6	Incentive and research for conversion to low-carbon and renewable energy sources					
5.7	Green Purchasing Programs					
5.8	Certification (formal or informal) of Reduced GHG's Throughout Supply Chain					
5.9	Local Bid Preference to Reduce Transportation GHG's					
RCI-6	**CUSTOMER-SITED DISTRIBUTED ENERGY AND COMBINED HEAT AND POWER**					
6.1	Incentives for Renewable Energy Systems at Residential, Commercial and Industrial Sites					
6.2	Incentives and Resources to Promote Combined Heat and Power (cogeneration units)					
6.3	Efficient Transformers on the Customer Side of the Meter					
6.4	Incentives and Resources for Passive Solar Heating			Design elements include south glazing, thermal mass, insulation, natural circulation		
6.5	White Roofs, Rooftop Gardens, and Landscaping (including Shade Tree Programs)					

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6.6	Focus on Specific End-uses Consumer Products/ Technology					
6.7	Passive Solar Heating design					
6.8	Passive Solar Hot Water					
6.9	Appliance Recycling/Pick-Up Programs					
6.10	Metering Technologies for Load Management and Choice					
RCI-7	**NON-ENERGY EMISSIONS (HFCS, PFCS, SF_6, CO_2 PROCESS EMISSIONS**					
7.1	Voluntary Industry-Government Partnerships					
7.2	Promotion and Funding for Leak Reduction /Capture, Recovery and Recycling of Process Gases					
7.3	Promotion & funding for Process Changes/ Optimization					
7.4	Use of Alternative Gases (other HFCs, hydrocarbon coolants/refrigerants, etc.)					
RCI-8	**GREENHOUSE GAS EMISSIONS-SPECIFIC GOALS AND POLICIES**					
8.1	Support for Switching to Less Carbon-Intensive Fuels (Coal and Oil to Natural Gas or Biomass)					
8.2	Industry-Specific Emissions Cap-and-Trade Program					

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8.3	Negotiated Emissions or Energy Savings Agreements					
8.4	Local Government Program for Voluntary Emission Targets by Businesses					
8.5	Provide Tools and Information for Residents, Businesses, and Communities to Perform GHG Inventories					
8.6	Carbon Tax					
RCI-9	**OTHER**					
9.1	Government Agency Requirements and Goals (including procurement)					
9.3	Municipal Energy Mgt.					
9.2	Carbon Neutral Building Requirement					
9.4	Regional Effort to Retrofit Existing Buildings (residential, commercial, public, and industrial) for Energy Efficiency					
9.5	Focus Energy Efficiency Efforts on Specific Market Segments (e.g. low-income housing, small & medium enterprises, etc.)					
9.6	Energy Efficiency Reinvestment Funds					
9.7	Industrial Audits					

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9.8	Focus on Industrial Ecology/ By-product Synergy					
9.10	Promote Virtual Net-Metering for Campuses, Municipalities and Businesses					Recommended by TWG member
RCI-10	**MANUFACTURING AND INDUSTRIAL PROCESSES**					
10.1	Reduce GHG's and Embodied Energy Associated with… Cement Manufacturing					Refer to Industrial Processes Energy Efficiency Group findings
10.2	" …Chip Industry			*Addressed in AFW?*		
10.3	".. Semi-conductor Industry					
10.4	" ;;;High Tech Industry					
10.5	Develop Recommendations for Consumer Do-It-Yourself Projects with the Potential to Release GHG's					Air conditioning leaks, refrigeration appliance disposal, home fire extinguishers, etc.
RCI-11	**WATER USE AND MANAGEMENT (WM)**					
WM-11.1	**Water Efficiency Programs, Funds and Goals**					
11.1.1	Support Water Efficiency Goals and Their Achievement					CA SBx7-7 requires urban water suppliers to reduce per-capita water use by 20% by 2020
11.1.2	Pricing Programs that Promote Reduced Water Use through Inclining Block Rates			Ensure low-income users are not disproportionately affected		CA's Next Million-Acre Feet Report (CNMAFR)

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11.1.3	Increase Efficiency of Water Delivery Systems					CARB Scoping Plan, ICLEI Climate Action Handbook
11.1.4	Protect and Enhance Groundwater Reserves by Encouraging Reduced Water Consumption			Use groundwater draw down rates as metric for conservation achievement		
11.1.5	Expedite Full Implementation of Volumetric Metering			Volumetric metering vs. flat rate encourages conservation		Required by State law by 2025
11.1.6	Support, Implement and Educate on EPA's WaterSense Labeling on Devices and Appliances					See also: Association of CA Water Agencies' "Save Our Water" Program
11.1.7	Establish Rebate Programs, Low-Interest Loans and Grant Programs for Infrastructure Improvements					
11.1.8	Pay-for-Conservation Programs (from Point of Use to Source District)			Urban water users pay municipal irrigation or water districts incentives to conserve in exchange for a percentage of water saved		CNMAFR
11.1.9	Water Beneficiaries Fund Infrastructure Improvements for Providers					CNMAFR
WM-2	**WATER CONSERVATION**					
11.2.1	Promote and Incentivize Water Conservation					
11.2.2	Increase Water Recycling					CARB Scoping Plan

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11.2.3	Increase Greenspace Acreage			Increasing aquifer recharge		*See also AFW 12.4*
11.2.4	Encourage Ground Covers and Other Forms of Soil Moisture Conservation					
WM-3	**WATER AND ENERGY**					
11.3.1	Place Turbines in Wastewater Pipes to Generate Energy					
11.3.2	Use Energy-Return-On-Water-Invested in Energy Production Options Evaluation					
11.3.3	Reduce Energy Use in Desalinization Processes					
WM-4	**WATER EFFICIENCY IN RESIDENTIAL, COMMERCIAL AND INDUSTRIAL INFRASTRUCTURE AND OPERATIONS**					
11.4.1	Recycle Wastewater On-Site through Graywater Filtration Systems					
11.4.2	Increase Beneficial Use of Urban Runoff			Capture and put stormwater to beneficial use on-site or locally		CARB Scoping Plan
11.4.3	Lower Water Consumption to Lower Wastewater Processing Needs			Lower water consumption/ waste production lead to lower GHG emissions		*See also AFW 11.2*
11.4.4	Improve Commercial/Municipal Water Use Efficiency					CARB Scoping Plan; (use of rain barrels and drip irrigation, prevent lawn-watering during daylight hours, etc.)
11.4.5	Improve Residential Water Use Efficiency					CARB Scoping Plan; (use of rain barrels and drip irrigation, prevent lawn-watering during daylight hours, etc

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11.4.6	Support and Educate on Xeriscaping			Reduce acreage of water-intensive landscaping such as traditional lawns		